

corrections to the specification and a new set of drawings in which Figs. 1-10 were redrawn for clarity. A review of the submitted drawings revealed discrepancies with the originally submitted drawings in Fig. 2.

Applicant now submits for review and approval a corrected drawing sheet showing corrections to Fig. 2. It is respectfully averred that no new matter is presented, but rather corrections to conform the redrawn Fig. 2 with that which was originally filed.

Applicant respectfully requests entry of the drawing corrections, and that formal correction be deferred until allowance of the application.

CLAIM REJECTIONS - 35 U.S.C. §112

Claims 9 and 11 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states that terminology in claims 9 and 11 lack antecedent basis.

Claims 9 and 11 have been amended to correct antecedent basis and to overcome the rejection. It is respectfully proposed that claims 9 and 11 now particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully requests that the rejection of claims 9 and 11 under 35 U.S.C. §112, second paragraph, be reconsidered and withdrawn.

CLAIM REJECTIONS - 35 U.S.C. §102

Claims 1-7 and 9-10 are rejected under 35 U.S.C. §102(e) as being anticipated by Floyd et al. (U.S. Patent No. 6,069,043). Specifically, the Office Action states that Floyd et al. show all of the elements of the present invention recited in claims 1-7 and 9-10.

A rejection under 35 U.S.C. §102 can be overcome if it can be shown that the claims contain at least one element not found in any of the cited prior art references. Applicant respectfully submits that the present invention as recited in claims 1, 4 and 9, as amended, contain at least one element or limitation not found in the cited prior art reference. For instance,

Floyd et al. disclose gate electrodes which are expressly doped to the same conductivity type as the body region (col. 2, lines 37 - 47). However, the present invention as recited in claims 1, 4 and 9, as amended, recites that the gate contact trench structure contains material doped to the opposite conductivity type as that of the body region. The doping of the trench structure to a conductivity type that is opposite that of the body region produces several advantages not present in the devices disclosed by Floyd et al. In particular, the present invention as recited in claims 1, 4 and 9 permits a threshold voltage which is much lower than that possible with the devices in Floyd et al. In addition, the body region in the structures of the present invention can be smaller in dimension, and thus realize attendant advantages in reduced threshold voltage and $R_{DS(on)}$ values.

In distinguishing the present invention from the disclosure of Floyd et al. with respect to the above-mentioned differences, amended claims 1, 4 and 9 call for, respectively, at least the following elements not found in any of the cited prior art references:

- (1) a gate oxide and gate contact thereon extending along the length of said invertible channel and operable to invert the conductivity type of said invertible channel; **said gate contact containing a material of the other of the conductivity types;**
- (2) a plurality of spaced trenches having vertical walls extending through said epitaxial layer; a thin gate oxide on said vertical walls and **conductive polysilicon of said one of the conductivity types deposited into said trenches to define a polysilicon gate;**
- (3) a plurality of spaced trenches having vertical walls extending through said epitaxial layer; a thin gate oxide on said vertical walls and **conductive polysilicon with a P type conductivity deposited into said trenches to define a polysilicon gate;**

(Emphasis added)

Since the present invention defined in amended claims 1, 4 and 9 recites elements not found in the cited prior art reference, Applicant respectfully submits that claims 1, 4 and 9

are allowable over the disclosure of Floyd et al. It is respectfully believed that the rejection of claims 1, 4 and 9 under 35 U.S.C. §102(e) is now overcome. Applicant respectfully requests that the rejection of claims 1, 4 and 9 be reconsidered and withdrawn.

Claims 2, 3, 5-7 and 10 depend on and further limit claims 1, 4 and 9, respectively, and should be allowable for at least that reason, in addition to any further recitations contained in each. Applicant respectfully requests that the rejection of claims 2, 3, 5-7 and 10 under 35 U.S.C. §102(e) be reconsidered and withdrawn.

CLAIM REJECTIONS - 35 U.S.C. §103

Claims 8, 11-13 and 14-15 are rejected under 35 U.S.C. §103(a) as being obvious over Floyd et al. In particular, the Office Action states that it is old and well known in the art to vary concentrations of a doped material to obtain desired threshold voltages and ohm resistances for MOSFETS.

Claims 14 and 15 are canceled, making the rejection of those claims moot.

Applicant respectfully submits that claims 4 and 9, as amended, now recite elements not found in the cited prior art reference. Specifically, claims 4 and 9 now recite that the material of the gate is of a conductivity type different than that of a channel material, or an epitaxially deposited layer, as discussed above. These amendments are supported by the specification and shown in the drawings as originally filed. Applicant respectfully submits that all of the claim limitations are not taught or suggested by the prior art reference, as is required to establish a *prima facie* case of obviousness. MPEP §2143.03.

In addition, applicant respectfully submits that Floyd et al. teach away from the present invention, by disclosing that the gate electrodes must be doped to a conductivity type that is the same as that of the body region (column 2, lines 45-47; column 4, lines 51-61). It is thus respectfully believed that the cited prior art reference does not teach or suggest the present invention, as recited in claims 4 and 9, as amended.

Because claims 8 and 11-13 depend upon and further limit claims 4 and 9, applicant respectfully submits that they should be allowable for at least that reason, in addition to any further recitations each contains. Applicant respectfully submits that the rejection of claims

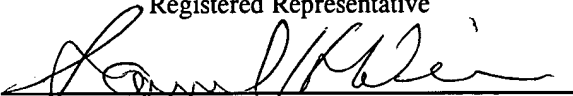
8 and 11-13 under 35 U.S.C. §103(a) should be overcome, and respectfully requests that the rejection be reconsidered and withdrawn.


CONCLUSION

It is respectfully submitted that the foregoing is a complete and accurate response to the present Office Action. Applicant presents new claims 16-22 for review by the Examiner, and respectfully proposes that the new claims recite subject matter already in the application which applicant has a right to claim. No new matter is added. Applicant believes that, in view of the above amendments and remarks, the application is now in condition for allowance, and notice to that effect is hereby earnestly solicited. If it is believed that an interview would contribute to allowability of the present application, the Examiner is requested to call the undersigned counsel at the telephone number given below.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Asst. Commissioner for Patents, Washington, D.C. 20231, on August 1, 2000

Respectfully submitted,

Samuel H. Weiner
Name of applicant, assignee or
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Signature
August 1, 2000
Date of Signature


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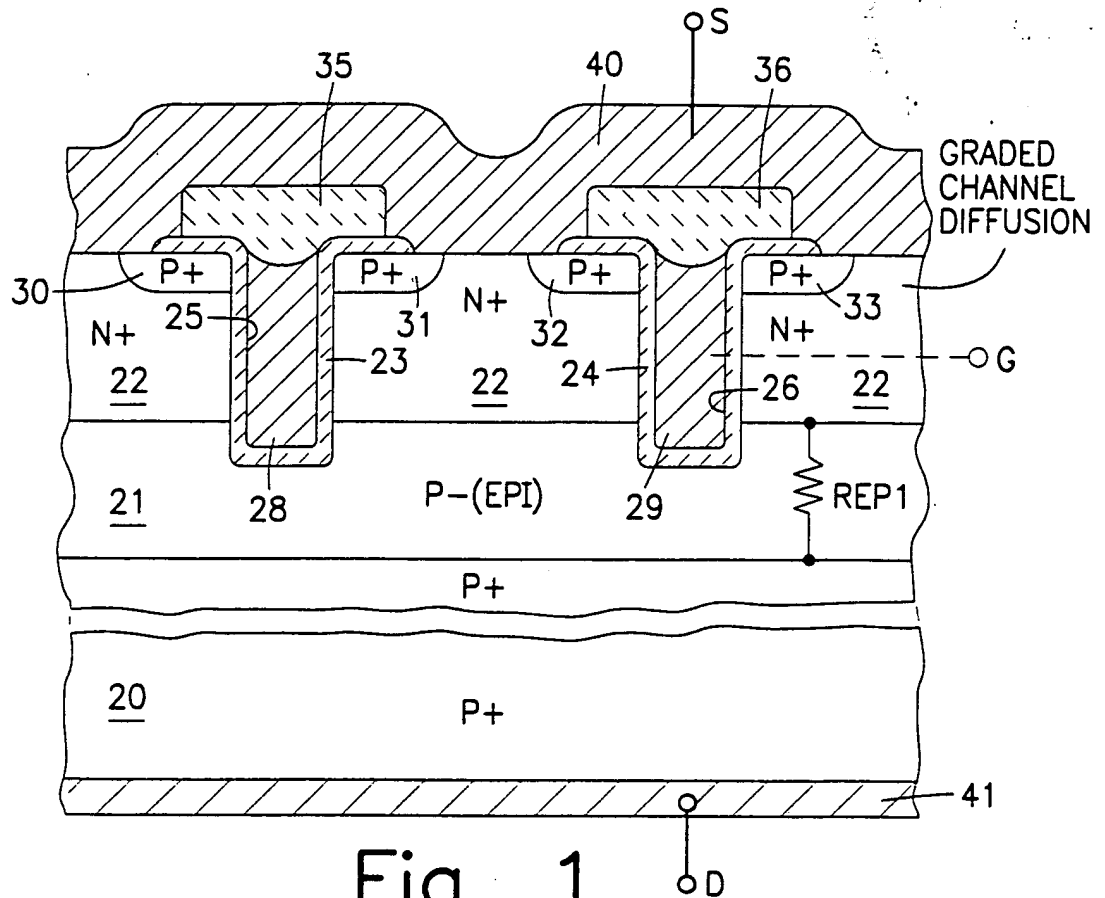


Fig. 1
PRIOR ART

